

# Material, Method and Place: Architectural Investigations Through Making

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I know how to trim evergreens.

This occurred to me as I sat down to write this morning after working in my yard. My arms are scratched and dirty after carefully removing dead branches from the center of the trees, trimming the lower limbs, making sure grade was cleared and there was provision for adequate water and access to adequate light. I know how to trim evergreens because I listened to the trees and learned, because I was engaged in and open to the immediacy of the experience.

I have the scratches to prove it.

Of course this is nothing unique, everyone must rely on their "instincts" when involved in a fluid process such as the trimming of a tree. The immediacy of the experience, the act of "doing", demands a certain reliance on an intuitive understanding grounded in minutia and detail:

Which trimmer to use? Where to grab the branch; at what angle? How to remove the debris from the tree? How much to remove? All questions which inform the way one approaches the task, in this case in the way one comes to "know the tree".

It is rare that architects come to know their buildings in this same way. It is rarer still that students explore or even consider the potential for design in this type of finer grain thinking; the architectural potentials in material selection, method of assembly and detail. How can educators approach teaching these skills to students who generally have a limited understanding of tectonics and are often unable or unwilling to bring a critical focus to their work with regard to matters of materiality and detail?

I have searched for ways both in my teaching and in my professional work to ground the design process in the immediacy of architecture, in its materiality, while at the same time fully engaging and challenging one's creative potential. To this end I have done a number of projects working with students which involve building at full scale, two of which I would like to offer here as case studies.

This paper will provide a brief description and personal account of each project, discuss the varied methods of involvement and outcomes for the students, and conclude with reflection on the impacts of these projects on my own methodology and development as an educator.

## CASE STUDY NO. 1: THE MILK HOUSE INSTALLATION

The milk house installation attempts to simultaneously *heal* and *reveal* an existing historic shed in an advanced state of dilapidation. The work searches for a response to place grounded in emotion and celebrates the rich history of the shed in the moment. The project gains its name from the former use of the agrarian outbuilding constructed in 1872, and was funded with an Arts Commission grant obtained by the author. The project was highly directed and the basic idea, although undeveloped and still very fluid, was already in place at the time of the students' involvement.

The conceptual approach to the project borrows from a number of precedents. The project looks to the work of Gordon Matta-Clark who reveals through dissection, his violent interventions offering a new understandings of the familiar and "interrogating the relationship between art and place".<sup>1</sup>



Figure 1. (left) Figure 2. (right) The milk house installation: students at work both "off" and "on-site"

The milk house looks to the work of David Ireland who, unlike Matta-Clark, treats discarded buildings with a respect approaching reverence, "finding new meaning through the peeling away of layers of history".<sup>2</sup> In both his Capp Street home and the Headlands Center for the Arts Ireland approaches the restoration of the ordinary as an archeologist might approach a historic site, celebrating and revealing the layers of time in a building and searching for aesthetic potential in the process of maintenance and repair. And the milk house looks to the work of Robert Irwin, who's "site conditioned responses... begin with an intimate hands on reading of the site".<sup>3</sup>

When beginning work on the shed, students had to balance the need for repairs to the building with an aesthetic agenda, keeping the new interventions discrete and distinct from those that had been layered onto the building by previous generations. Cuts in the floor required to access rotting support beams were left in place rather than repaired, a steel exoskeleton was added to brace and reinforce

the structure as needed. Weathered roof panels were removed and replaced with corrugated plexiglass, allowing a dance of light to cascade through the skip sheathing in the roof (fig. 2).

The interior was cleaned and coated throughout with multiple layers of gloss polyurethane. What had been derelict became precious, students gained an intimate understanding of the building through their immediate experiences on site. A scheme was developed which offered the building itself as the work of art. The proposed installation was to serve as both a bridge and a viewing platform intended to celebrate the existing space, "reawakening (the participants) to their surroundings".<sup>4</sup>

The bridge consisted of a steel framework clad in a screen of wood slats, milled from floor boards salvaged from an adjacent barn. The slat screen was processed with a variety of transparent finishes, each individual board hand lashed to the frame with openings in the screen designed to correspond to "moments" identified by the students in the sheds

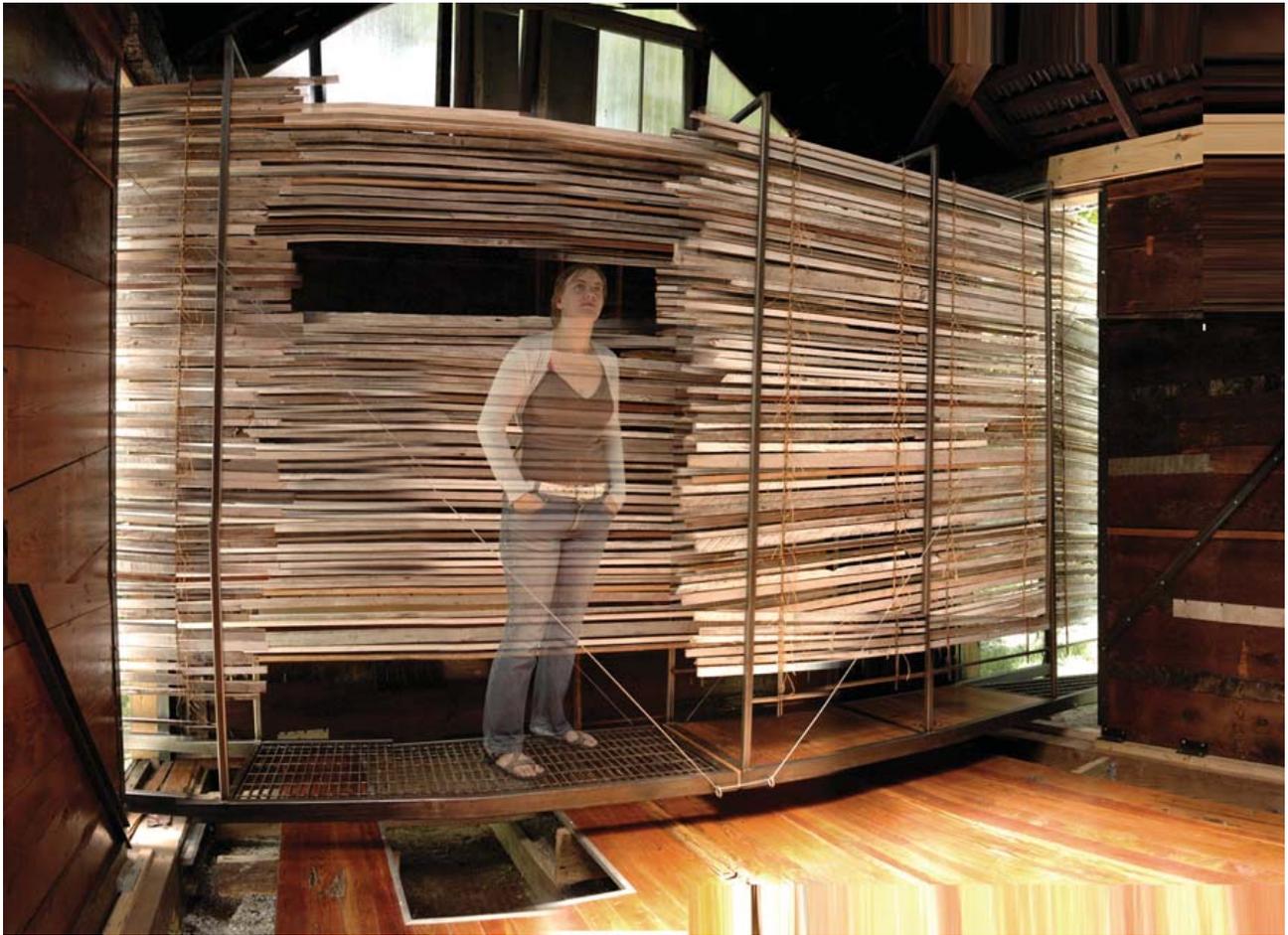


Figure 3. The milk house installation

interior. The bridge was built off-site and broken down into two pieces for transport.

The span hovers delicately six inches above the floor, woven between structural timbers. The bridge only touches the shed at two exterior compression points which actually help to strengthen and stabilize the original structure. The compression points also serve as anchor points for a pair of tension cables which support the center of the span.

Students became involved with the design of the project on an intimate level. To take one example, selected students prepared a series of proposals and mock ups of both the treatment of the wood slats and their method of attachment to the frame. These proposals were reviewed with the group.

How were the slats to be cut, treated, attached to the frame? What criteria informed their density and

method of attachment? What material to use, how to tie it?... all questions students were asked to consider as they simultaneously weighed strength, stability, and aesthetic concerns along with the relative degree of work and the costs involved with the various solutions. (fig.1)

This process played itself out again and again throughout the project. To consider the work happening on site:

What to repair, what to remove, what to replace; remain? How to stabilize, how to balance performance and aesthetic concerns with cost and time? (fig. 2)

As they worked on site students began to take ownership of the project, exploring the buildings details, oddities and the layers of time embodied in the structure. As the building was dissected stu-

dents combined an analytical understanding of the building with an emotional understanding, the latter grounded in textures, smells, dirt, work and sweat.

The students came to understand the shed in the same way I came to know the evergreens, and realized that powerful opportunities existed in even the smallest of details.

### **CASE STUDY NO. 2: THE LIGHT SAIL INSTALLATION**

The Light Sail is an interactive, site specific installation intended to reveal and accentuate the unique qualities of its historic site. The project was the result of a two week intensive workshop as an invited faculty at Dalhousie University leading a "Free Lab", and was as much a learning experience for the author as for the students involved in the project.

My own learning experience began prior to my arrival in Halifax. As I was preparing to leave on my long drive, I found myself having a friendly discussion with a colleague about the upcoming project. My colleague suggested to me that I needed to have a "grand failure", a suggestion at the time I took in jest but found myself thinking about more and more over the course of the long trip.

*A grand failure...*

Letting go of control? Pushing boundaries... what exactly was he getting at?

Upon arrival in Halifax, I was having dinner at the home of my hosts and was meeting some of the other Free Lab instructors (six labs run concurrently) for the first time. I had just arrived after a very long day on the road, the last leg of a long drive and was predictably exhausted. This dinner was my first stop upon arrival and the Free Lab was to begin the following morning. The Lab was scheduled to last for just over two weeks; an ambitious schedule for a construction project of any kind. I intended to do a site specific installation dealing with "light" (as I had stated in the proposal posted to recruit the students), but had no idea what I was going to build or where I was going to build it. I had very little money to build with. I wanted to do something derivative of a place that I was visiting for the first time.

Over dinner I discovered that the other instructors in fact did, to varying degrees, have specific ideas of what they were building. All had a building site, most had external funding (some extensive), and some were local, familiar with and grounded in the place.

*A grand failure...* I thought my colleague would be very pleased as sitting there eating dinner I felt I had set myself up for just that.

The next morning I met with the students, a group of ten fourth year undergraduates. After confiding I did not yet have the project defined, I scrambled to establish some credibility with the students who were understandably concerned, and we reviewed a range of precedents and discussed a conceptual approach we could bring to the project. After coffee and introductions we set out on a walking tour of the area, and with the students as my guides we considered various sites for our installation. Unlike the milk house, there was no idea or preconception where this brief fifteen-day workshop was going to lead. *There was no safety net.*

The walking tour ended at a magnificent set of grain silos located along the historic waterfront near downtown which seemed like a perfect site for our project. Through the students network of connections we were not only able to gain access to the site, the contents of an old warehouse adjacent to the silos were made available for our use as well! We had found a compelling site for our project on the very first day, the one condition being that we present our proposal and have it approved by the property owners prior to beginning construction. This immediately brought a sense of urgency to the process; with only fifteen days for the lab, we needed to present our idea and confirm that we could build on the site just as soon as possible!

We began with one group of students documenting the site conditions through sketching, writing, material samples, photography and charcoal rubbings, and another group of students hurriedly cataloging the contents of the warehouse, largely salvaged and leftover construction materials, which then became the "kit of parts" for our design proposals. We spent an intense weekend designing and developing proposals back in the studio.

Upon returning to the studio, the site analysis group presented their work. The students discussed the

qualities of the site; the ever present bay breeze funneled and amplified by the enormous silo; the enormity and the juxtaposition of scales, the gritty texture of the industrial vernacular, and the sharp and harsh quality of the light, both direct and reflected off the silos. These qualities became the criteria which guided the design.

I challenged the group to design an installation that would both *respond* to and *reveal* these qualities, an installation that would both be derivative of and accentuate the existing condition of the site.

A number of proposals and avenues were explored but the group quickly gravitated toward a simple idea, to re-purpose a number of fluorescent light fixture diffusers that were salvaged from the warehouse. The diffusers had magical qualities. Depending on the angle at which they were held and their relationship to the light source, they varied from opaque to transparent, reflective to diffuse. The group began to envision the wonderful play of light that might be transmitted through a simple field of the diffusers suspended in a plane, a "sail" of sorts, derivative of the maritime vernacular of the area.

As the group was developing the design, ideas were tested through full scale mock ups. Working with the instructor, the students devised and tested a method of hanging the diffusers that allowed them to pivot independent of one another. When stimulated by the wind, the diffusers would gently sway creating a wonderful dance of light across the surface and revealing the natural condition of the breeze. As a further development of this idea the students decided that the entire field of diffusers should rotate in order to follow the sun throughout the course of the day.

Finally, the students considered the life of the project after dark and designed a bank of lights that would allow projection onto and through the field of diffusers at night, engaging the massive scale of the adjacent silos through the projection of light. As a development of this idea a platform was inserted between the light source and the "sail", and a system ropes and pulleys was installed to allow for the mechanical manipulation of selected diffusers. Participants were enabled to "project a play of shadow combining both geometric and human silhouettes"<sup>5</sup> onto the walls of the silo.

The group went about building a scale model of this idea for presentation to the property owner while simultaneously working out details, sourcing and pricing materials and creating virtual representations of the project. The design was presented to the property owner and approved on day five of our fifteen day workshop. The project was given a name; the "Light Sail".

The proposed design required the fabrication of a fairly complex armature which was to be built primarily of steel, accounting for the majority of our modest \$1,000 budget for materials. As the project began to take shape problems were predictably en-



Figure 4. The Light Sail Installation, in process off-site

countered, and technical solutions were worked out with an eye for aesthetic and the utmost attention to detail. To name two examples:

The method of attachment for the diffusers caused them to rotate slightly forward in their state of repose rather than hanging plumb (vertical), which was the desired effect. Students had to design, source, size and fabricate

twenty four individual counterweights to bring the center of gravity of each diffuser in line with the pivot point (of attachment) so that the field hung vertically and uniformly.

The horizontal rods used to attach the diffusers bent slightly when loaded, causing the diffusers to bind rather than pivot freely. A second set of diagonal rods was added to the assembly to correct the problem. The diagonal rods were threaded on one end and bolted through corresponding tabs that were retrofitted to the frame. The other end was bent at a right angle and welded to a steel collar tie added to the shaft. By adjusting the threaded end of the rod the shaft could be raised or lowered as desired to keep the diffusers perfectly plumb and aligned.

Many “tweaks” similar to the ones described above began to define the aesthetic, and without exception, the thoughtful resolution of problems enhanced the quality of the work. Through *making*, the students could see that the aesthetic expression was rooted in the function of the piece, and the “problems” encountered during the fabrication, while sometimes frustrating, were in fact opportunities for design.

In addition, the students were very resourceful throughout the process. A group of students took responsibility for documentation of the process, preparation of graphic materials, a website, and promotion of the “opening” in the media. Another group went about preparing the site to receive the work. Salvaged wood from the warehouse was used to form an octagonal pad which allowed the work to rotate on site. The same group made arrangements with a local batch plant to have “tails” from a commercial pour dropped at the site and managed to get the pad in place at no cost, an important initiative given our limited resources!

The project culminated in a one-day event on site, an opening which drew over 200 guests, and, thanks to our “promotional” team, a good bit of media attention. The day of the opening was the first and only day that the entire installation was assembled. After focusing so much energy and attention on the design and fabrication of the armature, in the end, as intended, it was the screen of diffusers, the “sail”, that defined the project. The play of light on and through the diffusers was magical during the day and even more spectacular at night!

## CONCLUSIONS

The Light Sail and the milk house projects have much in common, first and foremost they both use installations as a means of architectural investigation, suggesting the work be “reactive to its site, informed by the contents and materials of its location”.<sup>6</sup>

Both projects are temporary, “freed from the mandates of (firmness) and (commodity), installations offer architects the opportunity to explore delight”.<sup>7</sup> Due to the freedom offered by both their temporary nature and the project parameters, both the milk house and Light Sail installations were able to amplify specific architectural criteria, generating a pure response to the conditions of their respective sites and embracing the potential in material, assembly and detail. Both projects were grounded in an intimate understanding of *place*.

These projects also both offer students the opportunity to present their work with the materials still under their finger nails; to inhabit their work at full scale and to celebrate the immediacy of architecture; important counterpoints to the “distance and disengagement”<sup>9</sup> often associated with virtual representation. Students learn that materials seldom behave as anticipated, and that fabrication is an iterative process. Students learn that design intention must be informed by the materials and methods of production. Students learn, as they did in both of these case studies, that potential for meaningful expression exists at all levels throughout the course of a project.

The two projects have distinct differences as well, both in the way the work was conceptualized and in the way the work was produced. I consider the Light Sail to be a more successful model for a number of reasons, some personal and some having to do with the structure of the workshop.

The structure of the Free Lab was unique. The short deadline, very limited funding, and the challenge of doing work within a new university system in an unfamiliar place created an anxious pressure which was complemented by the luxury of complete focus and no distractions. There was just the project, the students, and the place. The temporary nature of the work as well as the short timeline intensified the experience and the focus of the moment.



Figure 5. The Light Sail Installation on the night of the opening.

The completed project had a life of exactly one day, an appropriate life for a project that was designed and produced almost completely “in the moment”. There was a public opening, an event, a bright short life full of magic, energy and pride. I left town the next day, and due to liability concerns on the part of the property owner the project was dismantled and put into storage. I found the temporary nature of the work empowering, the memory of the work became amplified because it was not allowed to decay or grow old. It existed only in the moment and was recorded on the night of the event when the energy and intensity of the workshop was still fresh; alive and embodied in the object.

The milk house, by contrast, was done over the course of a semester in the context of an elective. The outside distractions for both myself and my students were numerous, and although some of the students took ownership and invested themselves in the work, the project was, for the most part, a secondary concern. The project lacked the urgency

and the intensity of investigation of its shorter but more immersive counterpart. In addition, given that I had obtained funding for the project with the idea for milk house already in place, the students were not part of the dialogue from the outset. As a result, they never came to feel ownership of the project in the same way I believe the Dalhousie students did.

It is fair to say that each project was highly directed, and equally fair to say that in each case the projects were truly collaborative efforts with the students clearly leaving their mark on the finished work. There is a fine art to directing students in such a way that they feel both critically challenged and feel ownership of the project, and I believe Light Sail was more successful in this regard, perhaps because of the intensity of the experience, perhaps because the collaboration was more genuine. I believe the students also felt empowered during the Free Lab by the fact that I was highly dependent on them in ways that during the milk

house project, designed and constructed within the familiar setting of my own university, I was not.

Reflecting on these projects I find I still have more questions than answers, but perhaps finding good questions to ask is an important step as one matures as an educator. I think back to the example of the evergreens. I came to know the trees, but was my understanding grounded in concern for the trees health or was I trying to mold them to my own idea of how they should grow? I wonder where the boundary between guidance and ownership of a project lies, and I wonder to what extent ones passions can obscure these boundaries? How does one include students in a way that ensures them the richest possible learning experience?

Had placing myself in the uncomfortable situation at the outset of the Free Lab, of not knowing and not planning, of facing the very real possibility of a "grand failure", contributed to the project's success? Had it resulted in a richer learning experience for the students? Can organizing a project to guarantee a "good" result constrain the potential for a great one?

These are the questions I am thinking about now as I move ahead with my work, perhaps answers await me at the end of the next project...or perhaps with the next project the questions will simply continue to change and grow...

## ENDNOTES

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